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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,080	03/05/2002	William J. Hunt	57080US002	6723

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EXAMINER	
BERNATZ, KEVIN M	

ART UNIT	PAPER NUMBER
1773	

DATE MAILED: 06/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/091,080	HUNT ET AL.	
	Examiner	Art Unit	
	Kevin M Bernatz	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8 and 10-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 10-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4/4/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Amendments to claims 1, 10, 13 – 17 and 19 and cancellation of claim 9, filed on March 23, 2005, have been entered in the above-identified application.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Examiner's Comments

3. Regarding the limitation(s) "superabrasive" in claims 1 – 8 and 10 - 19, the Examiner has given the term(s) the broadest reasonable interpretation(s) consistent with the written description in applicants' specification as it would be interpreted by one of ordinary skill in the art. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); *In re Donaldson Co., Inc.*, 16 F.3d 1190, 1192-95, 29 USPQ2d 1845, 1848-50 (Fed. Cir. 1994). See MPEP 2111. Specifically, the Examiner notes that the only abrasives which the art recognizes as "superabrasives" are natural or synthetic diamond or cubic boron nitride (*see applicants' specification, paragraph bridging pages 3 – 4 and Chen et al., U.S. Patent No. 5,062,865, col. 2, lines 23 – 25*). The Examiner notes that applicants do not have support for any materials other that those listed above.

Request for Continued Examination

4. The Request for Continued Examination (RCE) under 37 CFR 1.53 (d) filed on March 23, 2005 is acceptable and a RCE has been established. An action on the RCE follows.

Specification

5. The abstract of the disclosure is objected to because the document ID at the end of the abstract should be removed. Correction is required. See MPEP § 608.01(b).

Claim Objections

6. Claims 1 – 8 and 10 – 19 are objected to because of the following informalities: the term "AV" is used without being properly defined in the claims, especially since the abbreviation "AV" is not an art recognized abbreviation and is confusion with the art recognized term "Amine Value" (e.g. see claim 16). This objection can be overcome by inserting the definition of "AV" from the specification (*page 2*) into the independent claims. Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claim 19 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a product made using a binder precursor, does not reasonably provide enablement for the final product possessing the binder *precursor*. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. This rejection can be overcome by amending the claim to recite that the continuous phase is formed from a reactive curing binder precursor.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1 – 4, 7, 8, 10 – 12 and 16 – 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Kendall et al. (U.S. Patent No. 6,848,986 B2) – ***and*** –

11. Claims 1 – 4, 7, 8, 10 – 12 and 16 – 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Kendall et al. (U.S. Patent App. No. 2003/0194961 A1). The Examiner notes that '961 A1 is the Published Application of Patent '986 B2.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding claims 1 – 4, 7, 8, 10 – 12 and 16 - 19, Kendall et al. disclose embodiments meeting applicants' claimed limitations since the dispersant Solsperse 32000 meets the claimed limitations (*'986 B2: Table 1, example 1; and col. 4, line 37 bridging col. 5, line 6; '961 A1: Table 1 and Paragraphs 0030 – 0032*).

12. Claims 1 – 4, 7, 8, 10 – 12 and 16 – 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Kendall et al. (U.S. Patent App. No. 2003/0024169 A1)

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding claims 1 – 4, 7, 8, 10 – 12 and 16 - 19, Kendall et al. disclose embodiments meeting applicants' claimed limitations since the dispersant Solsperse 32000 meets the claimed limitations (*Table 1, example 1; and Paragraphs 0027 – 0029*).

13. Claims 1 – 4, 7, 8, 10 – 12 and 16 – 19 are rejected under 35 U.S.C. 102(e) as being anticipated by Kendall et al. (U.S. Patent App. No. 2003/0017797 A1)

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding claims 1 – 4, 7, 8, 10 – 12 and 16 - 19, Kendall et al. disclose embodiments meeting applicants' claimed limitations since the dispersant Solsperse 32000 meets the claimed limitations (*Table 1, example 1; and Paragraphs 0030 – 0032*).

Claim Rejections - 35 USC § 103

14. Claims 1 – 8 and 10 – 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bruxvoort et al. (U.S. Patent No. 5,958,794) in view of Yamamoto et al. (U.S. Patent No. 5,244,979), Kamikubo et al. (U.S. Patent No. 5,698,618), and Cayton et al. (U.S. Patent App. No. 2003/0032679 A1).

Regarding claim 1, Bruxvoort et al. teach an abrasive article comprising a backing having a major surface (*Figure 4, element 59*) and an abrasive coating on the major surface of the backing (*element 57*) comprising at least 20% by weight of a superabrasive particle (*col. 19, lines 14 – 27 and col. 23, lines 10 – 19*), wherein the abrasive coating is derived from an abrasive slurry comprising superabrasive particles, a continuous phase comprising a reactive curing binder precursor, and a dispersant (*col. 22, line 65 bridging col. 23, line 49; col. 26, line 8 bridging col. 27, line 19; and examples*).

While Bruxvoort et al. disclose the advantage of utilizing dispersants for improving the dispersing ability of the superabrasive particles, Bruxvoort et al. fail to explicitly disclose using polymeric dispersants meeting applicants' claimed limitations.

However, Yamamoto et al. teach polymeric dispersants having a *number average* molecular weight determined by gel chromatography of 1000 – 100,000 and an amine value of 10 – 200 (*col. 6, lines 24 – 65 and col. 10, lines 29 - 35*), wherein the dispersant possesses excellent compatibility with a variety of resins, causes no yellowing and are compatible with inorganic compounds identical to those used in the abrasive art (*col. 3, lines 10 – 20 and col. 17, line 67 bridging col. 18, line 11*).

Kamikubo et al. teach substantially identical dispersant aids, but recites a *weight average* molecular weight in the range of 1000 – 100,000 in combination with an amine value of 10 – 200 (*col. 2, lines 23 – 44*). While the Examiner deems that one of ordinary skill in the art would readily recognize the above references as analogous to Bruxvoort et al. since the dispersing of inorganic abrasive particles in a resin is substantially identical to the dispersing of inorganic coloring or magnetic particles in a resin, the Examiner further notes that Cayton et al. provides an explicit teaching of using dispersants meeting applicants' claimed limitations in the abrasive art, i.e. Solsperse 32000 (*Paragraphs 0001, 0004, 0005, 0021, and 0030*).

While Yamamoto et al. teach a *number average* molecular weight (M_n), the Examiner notes that the combined teachings in the art, along with the well known knowledge that the *weight average* molecular weight (M_w) always is larger than M_n, usually by a factor of 2 (*see cited references to Cowie and Odian below to support the Examiner's position of Official Notice*) still results in a substantial overlap in the teachings of Yamamoto et al. with the claimed invention. I.e. an "average" difference between M_n and M_w (M_n = ~½ M_w) would result in a range of about 2000 – 200,000 in M_w for the disclosed Yamamoto et al. invention, which is substantiated by the Kamikubo et al. reference which teach 1000 – 100,000 in M_w. This would give an AV range of 0.05 – 100, resulting in a large quantity of dispersants taught by Yamamoto et al. being read upon by applicants' claimed property limitations (e.g. Solsperse 32000 is reasonably expected to have a M_n > 1000 given the disclosed M_w of 3060 in applicants' specification).

As such, applicants' present claims are merely attempting to claim known dispersants via a novel "formula" overlapping the general teaching of molecular weight and amine value in the art, which is permissible upon a showing of unexpected results. However, since patentability predicated on unexpected results requires that the claims be commensurate in scope with the showing of unexpected results and applicants have not presented evidence supporting any alleged unexpected results for the entire broad ranges presently claimed, the disclosed overlap with the prior art teachings is deemed to render obvious the claimed invention.

Finally, the Examiner notes that Yamamoto et al. provides clear teaching as to the effects of controlling the *number average* molecular weight (again, which is directly related to the *weight average* molecular weight) and the amine value, and the effect of optimizing these properties on the dispersant qualities (*col. 9, line 44 bridging col. 10, line 35*).

It would therefore have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Bruxvoort et al. to use a polymeric dispersant as taught by Yamamoto et al. and supported by Kamikubo et al. and Cayton et al., since such a dispersant is known to have good compatibility with known abrasive particles and known resins used in the abrasive art.

Regarding claims 2 – 6, 13 – 16 and 19, these claims are met for substantially identical reasons as described above (i.e. Yamamoto et al. teach overlapping values of the claimed property ranges and there is presently no evidence of record supporting a position of unexpected results for the claimed ranges).

Regarding claims 7, 8 and 10 - 12, Bruxvoort et al. disclose abrasive coatings meeting applicants' structural and material limitations (*col. 18, line 16 bridging col. 23, line 49*).

Regarding claims 17 and 18, Bruxvoort et al. in view of Yamamoto et al., Kamikubo et al. and Cayton et al. disclose the product limitations as recited above and Bruxvoort et al. further disclose the method limitations (*col. 39, line 1 bridging col. 41, line 22 and Examples*).

Response to Arguments

15. The prior rejection of claims 1 – 8 and 10 - 19 under 35 U.S.C § 103(a) – Bruxvoort et al. in view of various references

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection. In so far as they apply to the present rejection of record, applicant(s) argue(s) that there is no reasonable expectation of success to utilize Solsperse 24000 (or related dispersants) with superabrasive particles and that the secondary references relied upon are not analogous art since they are not in the "abrasive" field. The examiner respectfully disagrees.

First, the Examiner notes that Cayton et al. provides an explicit teaching that dispersants such as Solsperse 24000 and 32000 are known as being useable in the abrasive art. Second, as previously argued by Examiner Uhlir, a reference can be analogous if it solves the same problem, which the relied upon secondary references both do by solving the problem of a dispersant that is compatible with a narrow range of

resins and inorganic particles used as abrasives, among other uses. As such, the Examiner deems that these is sufficient similarity between the teachings that one of ordinary skill in the art would have readily turned to the relied upon references when seeking a solution to the problem of choosing an improved dispersant to be utilized according to the teachings of the Bruxvoort et al. invention.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. "Principles of Polymerization", 3rd Edition, Ed: Odian, G., John Wiley & Sons, 1991, pages 22 – 24, teach that the polydispersity index (PDI) (M_w/M_n) is a measure of the breath of the molecular weight distribution of polymer and ranges from 1 for a monodisperse polymer to higher values, but M_w is always greater than M_n. "Polymers: Chemistry and Physics of Modern Materials", 2nd Edition, Ed. Cowie, J., Blackie & Sons Limited, 1991, page 10, teach that M_w/M_n averages about 2 for most polymers.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMB
June 10, 2005

Kevin M. Bernatz, PhD
Primary Examiner